UNIVERSITI SAINS MALAYSIA

Second Semester Examination
2012/2013 Academic Session

June 2013

EBS 328/3 – Prospecting Geochemistry
[Geokimia Carigali]

Duration : 3 hours
[Masa : 3 jam]

Please ensure that this examination paper contains EIGHT printed pages before you begin the examination.
[Sila pastikan bahawa kertas peperiksaan ini mengandungi LAPAN muka surat yang bercetak sebelum anda memulakan peperiksaan ini.]

This paper consists of EIGHT questions.
[Kertas soalan ini mengandungi LAPAN soalan.]

Instruction: Answer **QUESTIONS ONE** and **FOUR** other questions. If a candidate answers more than five questions only the first five questions answered in the answer script would be examined.
*[**Arahan**: Jawab **SOALAN SATU** dan **EMPAT** soalan lain. Jika calon menjawab lebih daripada lima soalan hanya lima soalan pertama mengikut susunan dalam skrip jawapan akan diberi markah.]*

The answers to all questions must start on a new page.
[Mulakan jawapan anda untuk semua soalan pada muka surat yang baru.]

You may answer a question either in Bahasa Malaysia or in English.
[Anda dibenarkan menjawab soalan sama ada dalam Bahasa Malaysia atau Bahasa Inggeris.]

In the event of any discrepancies, the English version must be used.
[Sekiranya terdapat sebarang percanggahan pada soalan peperiksaan, versi Bahasa Inggeris hendaklah digunapakai.]

...2/-

Answer question 1 and four other questions.

Jawab soalan 1 dan empat soalan lain.

1. Table 1 below is a geochemical data obtained from a company:

Jadual 1 berikut adalah data carigali yang diperoleh dari sebuah syarikat:

Table 1 - Geochemical data of a company

Jadual 1 - Data carigali dari sebuah syarikat

Sample No	Zn (ppm)	Cu (ppm)
1	24	7
2	25	9
3	42	12
4	50	15
5	52	18
6	29	10
7	26	10
8	23	7
9	89	32
10	72	11
11	31	11
12	115	37
13	535	350
14	48	17
15	1010	590
16	560	490
17	48	8
18	44	11
19	36	7
20	33	20
21	45	27
22	118	33
23	274	63
24	81	22
25	80	23

(a) Calculate the mean value for the two elements Zn and Cu.

Kira nilai min bagi unsur Zn dan Cu.

(b) Obtain the values of anomaly, background and threshold.

Dapatkan nilai anomali, nilai latar dan nilai ambang.

(c) Obtain the contrast for the two elements.

Dapatkan nilai kontras kedua-dua unsur tersebut.

(d) Calculate the correlation value from the plot

Dapatkan nilai korelasi di antara unsur Zn dan Cu.

(e) Construct bar histogram for Zn and Cu (use stem-leaf method only).

Bina histogram bar bagi kedua-dua unsur (guna kaedah ranting-daun sahaja).

(f) Construct cumulative frequency for Zn and Cu (use graph paper provided).

Plot histogram bertokok kedua-dua unsur (guna kertas geraf yang dibekalkan).

(g) Obtain the mode and the median.

Dapatkan nilai mod dan median.

(h) Give your comments as to the use of mean, mode and median in the geochemical exploration program.

Beri pandangan anda tentang kegunaan nilai min, mod dan median dalam carigali geokimia.

(i) Give your opinions as regard to the possibility of finding mineralization in the area and state your reasons.

Beri komen anda tentang kemungkinan wujudnya mendapan mineral di kawasan lokasi dan sertakan buktinya sekali.

(60 marks/*markah*)

2. With the aid of a flow chart, describe the various steps of a mineral exploration program. Include also the various decision stages that need to be undertaken by the management.

Dengan menggunakan carta alir, perihalkan langkah-langkah yang perlu dibuat semasa merangka program carigali. Sertakan juga tahap keputusan yang perlu diambil oleh pihak pengurusan program carigali tersebut.

(35 marks/*markah*)

3. Write short notes of the following items:

(a) Pathfinder elements

(b) Path indicator elements

(c) Contrast

(d) Anomaly

(e) False anomaly

(f) Mobility

(g) Background values

(h) Regional background values

(i) Leakage anomalies

(j) Mineral deposit

Tulis nota ringkas mengenai perkara berikut:

(a) Unsur perisik

(b) Unsur penunjuk

(c) Kontras

(d) Anomali

(e) Anomali palsu

(f) Kelincahan

(g) Nilai latar

(h) Nilai latar kawasan

(i) Anomali tiris

(j) Mendapan mineral

(35 marks/*markah*)

4. Dispersion pattern formed as a result of the movements of trace elements. Define dispersion. Describe how dispersion formed in both primary and secondary environments. Use diagram to illustrate your answers.

Pola serakan terjadi hasil daripada pergerakan unsur. Beri takrif serakan. Perihalkan bagaimana serakan terbentuk di dalam persekitaran primer dan sekunder. Gunakan gambarajah untuk mengilustrasikan jawapan anda.

(35 marks/*markah*)

5. Distinguish the three types of survey. State clearly their objectives. Describe what information you want to collect for each type of the survey and state the reasons why you choose them.

Bezakan ketiga-tiga jenis tinjauan. Nyatakan tujuan tinjauan tersebut. Perihalkan maklumat apakah yang anda mahu kumpulkan bagi setiap tinjauan tersebut dan nyatakan sebab-sebabnya.

(35 marks/*markah*)

6. With the aids of diagrams, describe and annotate on the diagrams the field conditions that warrant the use of geochemical exploration techniques.

Dengan menggunakan rajah, perihalkan keadaan lapangan yang menuntut kegunaan teknik carigali geokimia. Buat catatan anda di dalam rajah yang anda lakarkan.

(35 marks/*markah*)

7. Answer the followings:

Jawab soalan-soalan berikut:

(a) State and discuss the common practices and techniques taken during the geochemical exploration exercise in many gold exploration projects in Malaysia and worldwide?

Nyata dan bincang amalan dan teknik lazim yang biasa digunapakai dalam aktiviti penjelajahan geokimia projek-projek mineral emas di Malaysia dan dunia.

(17.5 marks/*markah*)

(b) Briefly discuss or explain the followings:

(i) Regional exploration

(ii) "Halos" or geochemical anomalies

(iii) Types of geochemical anomalies

Secara ringkas bincang atau terangkan maksud perkara berikut:

(i) Penjelajahan wilayah

(ii) "Halos" atau anomali geokimia

(iii) Jenis-jenis anomali geokimia

(17.5 marks/*markah*)

8. Answer the followings:

Jawab soalan-soalan berikut:

(a) State the common practices and techniques frequently adapted in Malaysia for placer/alluvial gold prospecting works in Malaysia.

Nyatakan amalan dan kaedah-kaedah yang lazim dipakai bagi kerja-kerja pencarigalian emas lanar/alluvium di Malaysia.

(17.5 marks/*markah*)

(b) Determine the total available reserve and proven recoverable of gold reserve based on the following prospecting results in an area from Dabong, Kelantan (PL 3/2006).

Total mineable gold reserve area: 85.0 Hactre
Average depth (pitting holes): 5.6 meter
The average ground value: 137 mg/m3

Recovery factor and purity are 80% @ 800 ppt purity.

Tentukan jumlah rezab emas yang terdapat dan emas yang terbukti boleh diperolehi berdasarkan keputusan carigali daripada kawasan daerah Dabong, Kelantan (PL 3/2006).

Jumlah keluasan rezab emas boleh dilombong: 85.0 hektar
Purata kedalaman (lubang pit): 5.6 meter
Nilai purata kandungan emas: 137 mg/m^3

Faktor perolehan dan ketulenan adalah 80% @ 800 bpr ketulenan.

(17.5 marks/*markah*)

- oooOooo -